COMMENTARY

Ending the Nuclear Age: The Manhattan Project II

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Fifty years ago, Chicagoans braced against a raw wind as they crammed street cars and the El on the second day of wartime gasoline rationing. On that bitterly cold, subzero day, December 2, 1942, in utmost secrecy, inside the doubles squash court beneath the West Stand of the University of Chicago's Stagg Field, the nuclear age was born.

Earlier in the century, scientists had theorized that the atom could be split and energy released. H.G. Wells had even envisioned a world with nuclear power and a war fought with atomic bombs in his 1914 novel, *The World Set Free*. By 1939, the atom had indeed been split, or fissioned, in a laboratory. And soon after, Albert Einstein and Leo Szilard had written to President Franklin Delano Roosevelt in a now famous letter that the United States should undertake to build weapons of mass destruction based on atomic fission before Hitler did.

The ultimate result, after initial delay, was the Manhattan District Project, the prosaic code name meant to disguise a mammoth, top secret scientific and engineering program to develop an atomic bomb. Now, in snowy Chicago, after its formal opening in the summer of 1942, the Manhattan Project was to begin the nuclear age by delivering the first of many tangible and spectacular achievements, the world's first controlled nuclear chain reaction.

The Manhattan Project scientists at the University of Chicago, led by Leo Szilard and Enrico Fermi, had constructed a large graphite pile to surround radioactive uranium. Cadmium control rods were ready to be inserted in order to absorb excess neutrons and prevent a meltdown or explosion. Control panels blinked and Geiger counters clicked and finally roared in the squash court balcony overlooking the pile. At that moment, Enrico Fermi raised his hand and announced, allowing himself a grin, "the pile has gone critical." After celebrating with chianti drunk from paper cups, the scientists slowly drifted away until Fermi and Szilard were left alone on the balcony. Szilard, who as a youth had dreamed of tapping limitless energy for interstellar exploration, blinked back tears. He shook hands with Fermi and said, simply, "This will go down as a black day in the history of mankind" [1].

Szilard's somber reaction to the achievement at Stagg Field was brought on by his understanding that the power achieved through controlled atomic fission was now inextricably linked to weapons and war. But, like others in the Manhattan Project who feared Hitler and all he was known to stand for, Szilard pressed on in order to beat Hitler to the bomb.

Between its inception in August 1942 and its completion with the bombing of Hiroshima and Nagasaki in August 1945, the Manhattan Project assembled the greatest scientific talent in the world, spent over $2 billion in constant dollars in a crash program that created 37 installations in 19 states ranging from plutonium production in Hanford, Washington, to uranium processing in Oak Ridge, Tennessee, employed 120,000 workers, and carried out the world's first nuclear bomb test at the Trinity site in Alamogordo, New Mexico, on July, 16, 1945 [2-5].

Ultimately, Leo Szilard and many other atomic scientists, especially those at Chicago, petitioned against

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the bombing of Hiroshima and Nagasaki, warned of a postwar nuclear arms race, and sought after the war to control or eliminate the nuclear weapons that they had helped to create. One Manhattan Project scientist, Joseph Rotblat, based at Los Alamos, went so far as to quit the Manhattan Project after learning in November 1944 that an allied intelligence mission, Project Alsos, had discovered that there was no counterpart German crash program to build the bomb. Rotblat then devoted himself to studying the effects of radioactive fallout and worked for disarmament and a nuclear test ban [6]. In the years since 1945, numerous prominent physicians, scientists, and citizens have assembled themselves in organizations like the Federation of Atomic Scientists, Pugwash, Physicians for Social Responsibility (PSR), International Physicians for the Prevention of Nuclear War (IPPNW), the Federation of American Scientists, the Union of Concerned Scientists, SANE, and the Council for a Livable World.

The efforts of these groups slowed and at times controlled the nuclear arms race, ended atmospheric nuclear testing, and led to a body of treaties that laid the basis for international cooperation [7-9]. But as we mark the 50th anniversary of the nuclear age, there still remain under the control of some seven or more nations over 20,000 strategic nuclear bombs, deliverable by rocket, plane, or ship to any place on the globe [10]. Over the next decade, by the year 2003 if all goes according to schedule, roughly 14,000 warheads, about two-thirds of the total, will be deactivated, dismantled, and disposed of without adequate international verification, inspection, or control. And, in the absence of substantive controls against proliferation, nuclear weapons technology of all kinds continues to spread around the globe.

Nevertheless, after the past decade's widespread and intense citizen opposition to the cold war system, to first strike weapons, space weapons, theater nuclear weapons in Europe, continued nuclear testing, the production of nuclear weapons and more, there is at long last a realistic chance to end, in effect, the nuclear age [11-13]. The breakup of the Soviet Union and the Eastern bloc, brought on in part by the staggering costs of the arms race and the failure of the communist system, and in part by recognition of the dangers and limitations of nuclear superpower status in an economically interdependent world, has reduced the long-standing threat of an all-out strategic nuclear weapons exchange.

This geostrategic fact, coupled with unilateral moves and then mutual agreements by Presidents Bush and Yeltsin at their June 1992 summit in Washington to reduce nuclear weapons in the United States and Russia to 3,500 and 3,000 nuclear warheads respectively (this so-called framework agreement has since been signed, though not ratified, as the START II Treaty), has finally produced favorable conditions for serious proposals and planning to end the nuclear age. Indeed, recent progress has led some to conclude that the nuclear era has practically ended with the end of the cold war [14]. But this is far from the case and by no means certain or inevitable. In fact, as we pass the 50th anniversary of the Manhattan Project and the nuclear age, humanity once again must choose, and rapidly, between alternative futures. Recent conservative challenges to President Yeltsin, Russian military complaints about the one-sided nature of the START II Treaty, the willingness of republics like Ukraine to use their remaining nuclear missiles as bargaining chips, and United States-Russian disagreements over how to deal with Serbia and Bosnia all portend a possible reversal of friendly United States-Russian relations and optimum conditions for disarmament. Similarly, overall U.S. nuclear strategy has not changed, and a number of recent policies leaked to the press during the Bush administration indicate continued reliance on nuclear weapons as a cornerstone of U.S. military dominance in the world [16,17]. And at no time during his election campaign did President Clinton indicate any sharp disagreement with such continued heavy reliance on large numbers of U.S. nuclear weapons. Further, the very fact of reduced superpower confrontation could diminish inhibitions against making or carrying out threats of nuclear attack in local or regional conflicts of all sorts because the fear of escalation to strategic exchanges is gone. The ending of an era of a superpower nuclear arms race may mark the beginning of a new, still dangerous era, that of nuclear proliferation posing a heightened risk of limited nuclear wars [18].

Only recently, for example, a two-sided nuclear conflict between India and Pakistan was reported to have been narrowly averted in May 1990, and little has happened to reduce the prospect of a recurrence. The Persian Gulf war of 1990-1991 saw the involvement of four nuclear powers against Iraq with the United States and Israel, and perhaps the British and French as well, deploying tactical nuclear weapons. Under public questioning, none of these four powers explicitly ruled out the first use of nuclear weapons if

necessary. Major newspapers quoted British and French officers predicting that their forces *would* retaliate against any gas warfare attacks with deployed tactical nuclear weapons [19,20]. Such tacit nuclear threats may actually have had some effect in deterring Iraqi use of chemical weapons but at the cost of setting a post-cold war precedent that could encourage such threats by Pakistan and others.

With the Soviet Union safely on the allied side in the Gulf, 45% of the American public was also prepared to use nuclear weapons "if it might save the lives of U.S. troops" [21-23]. These levels of support were two to four times higher than any recorded during the height of either the Korean or Vietnam Wars. And equally chilling was the response of an Indian diplomat when asked what the main lesson of the Persian Gulf war and overwhelming U.S. military superiority would be. He replied, "Never fight the United States without nuclear weapons" [18].

For these and other reasons, we have initiated a Manhattan Project II, housed at Physicians for Social Responsibility and co-sponsored by International Physicians for the Prevention of Nuclear War. It is supported by over 60 national and international organizations and a distinguished advisory board. The goal of the Manhattan Project II (MPII), outlined by Daniel Ellsberg in articles in the *Harvard Journal of World Affairs*, the *Bulletin of the Atomic Scientists*, the *Washington Post*, and elsewhere and transmitted by letter to the U.S. Congress and to Presidents Bush and Yeltsin before their Washington summit meeting in July, can be stated simply. " We seek to dramatically reduce the danger of nuclear war to near zero by the end of this decade" [24].

MPII does not call for total abolition before the end of the decade, but instead offers a coherent and realistic set of policy goals that would lead rapidly to very low numbers of weapons (measured in tens or hundreds) with an urgent and measurable public timetable from 1992-1995 that parallels the 1942-1945 timeline of the original Manhattan Project. This approach allows a broader range of groups, not all of whom are committed to total nuclear disarmament or who may not have board policies that say they are, to participate. To date, even groups that are philosophically pacifist are satisfied that this approach to disarmament is a realistic and bold one that advances their cause, while nuclear policy analysts of the *realpolitik* school appreciate MPII's implicit notion that how the world will keep track of and who will be allowed to hold onto the world's last few functioning nuclear warheads probably cannot be solved at this point, and certainly not adopted as U.S. policy on a very short timeline.

The necessary policy changes to reach the goals of the Manhattan Project II and to achieve agreement to them within three years, in time for the renewal of the Nuclear Non-Proliferation Treaty (NPT) and the 50th anniversaries of the bombings of Hiroshima and Nagasaki, can be outlined fairly easily. As the 60 or more organizations currently supporting the principles of the Manhattan Project II put it in a June 1, 1992 letter to the United States Congress:

> We believe the United States should, by August 1995, or sooner, initiate a series of steps, make policy commitments, and seek comparable commitments from other nuclear states to:
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> - Reduce nuclear warheads of the United States and Russia to well below 1,000 each.
> - Join the Russian and French nuclear testing moratoria this year and sign a Comprehensive Test Ban.
> - Adopt a policy of no-first-use.
> - Eliminate tactical nuclear weapons.
> - Pursue confidence building measures such as taking nuclear weapons systems off alert and separating nuclear warheads from their delivery vehicles.
> - Preserve the ABM Treaty, narrowly interpreted.
> - Register and tag all nuclear weapons, subject to verification, and transport and store all nuclear weapons to be dismantled under bilateral or international safeguards.
> - End the production of fissile materials for weapons and put fissile materials recovered from dismantled warheads under international safeguards.
> - Seek universal adherence to the Nuclear Non-Proliferation Treaty (NPT) and agree to strengthened antiproliferation regimes with enhanced and non-discriminatory inspection [25].

In order to achieve these goals, however, a massive national and international campaign will be needed that pulls together a variety of current programs and projects, both national and international, into a cohesive, coordinated effort. Such an ambitious goal is necessary not only because of the urgent and critical nature of the task, but also because nuclear weapons and national security issues of all kinds have become, with the end of the cold war, less salient with the public and the press. Simultaneously, peace and arms control organizations have generally become weaker. This is not because the world is no longer dangerous, but because the shift from a bipolar to a multipolar world has made the narrative frame for nuclear weapons, national security, and foreign policy issues

more diffuse and complicated to communicate to constituencies.

Thus, one of the first essential tasks of the Manhattan Project II, fundamentally opposite to the secrecy of Manhattan Project I, is to raise the visibility of nuclear weapons issues once again, to focus diverse goals, themes, and programs, and to drive home the simple message that the end of the cold war did not end the threat of nuclear war. Humanity has an urgent opportunity, perhaps for the last time, to end the nuclear age before nuclear technology and nuclear weapons spread around the globe. Such ideas can be summed up neatly by advertising slogans contemplated for the Manhattan Project II that capture both the short-term policy goals of the Project and its disarmament vision: "The Bomb. We built it. We can take it apart," and "The Bomb. An idea whose time has gone."

The Manhattan Project II, then, has a strong media component, along with careful policy analysis, grassroots organizing, sophisticated lobbying, and international cooperation. Because MPII was begun during the 1992 presidential campaign, much of the early organizing and media work aimed at merely raising the visibility and viability of nuclear weapons issues and creating a political climate where, when inaugurated, the successful candidate would feel a need to settle issues of nuclear arms reduction, proliferation, and strategic policy.

Such grassroots organizing and media work were necessary, especially when the poll-driven Democratic campaign failed to highlight arms control issues during the July Democratic Convention in New York. It is wise to recall that even President Jimmy Carter, now a PSR Peace Award winner and the last Democratic President to enter office pledged to arms control (he actually shouted "our ultimate goal—zero nuclear weapons!" in his Inaugural Address), finally launched new escalations in the nuclear arms race under the systemic and institutional pressures on his presidency. Given a world situation in continuous turmoil, as we shift to some as yet unknown "world order" after the cold war, even the progress in reducing arms to date is subject to erosion or reversal. Despite the achievement of a nuclear testing moratorium in October and a moderate, pro-arms control administration now in office, physicians and other activists concerned about nuclear disarmament are wise to continue a vigorous, vocal, independent, and long-range campaign.

To date, the Manhattan Project II has carried out a number of programs and helped to elevate the importance of national security and nuclear issues in the public eye. It has also served as a unifying concept in the disarmament community since it was first presented by the authors at a joint national conference held by PSR, the Professionals' Coalition for Nuclear Arms Control, and the Union of Concerned Scientists in Washington in late March 1992. For instance, of the more than 40 national organizations in Washington, D.C., with arms control and disarmament as part of their mission, *none* had planned significant activity before or during the Bush-Yeltsin Summit in June. This is in stark contrast to previous summits from the first Reagan-Gorbachev meeting in Geneva in 1985 through Reykjavik, Moscow, and Washington summits where peace groups presented petitions, demonstrated, created media events, and met with the Soviet officials.

However, the efforts of the Manhattan Project II to reinvigorate activism resulted in a joint policy statement signed by over 60 organizations and delivered to the White House and the Russian Embassy, the passage of legislation in the House just before the summit calling for deeper cuts in nuclear weapons, and the use of the summit as an occasion to give greater visibility to one of the movement's and Manhattan Project II's main goals—an end to nuclear testing. At the National Press Club just prior to the summit, Daniel Ellsberg, for PSR and the Manhattan Project II, along with Senator Mark Hatfield, co-sponsor of the nuclear testing moratorium act in the Senate, Dr. Bernard Feld of MIT (who as a young physicist was the assistant to both Szilard and Fermi at the original Manhattan Project), and Dr. Frank von Hippel, chairman of the Federation of American Scientists, called for a moratorium and outlined the goals of the Manhattan Project II. They presented to the press statements sent for the occasion calling for a testing moratorium and for a Comprehensive Test Ban by two other original Manhattan Project members, Dr. Glenn Seaborg, discoverer of plutonium and later Chairman of the Atomic Energy Commission, and Dr. Ray Kidder of the Lawrence Livermore National Laboratory. Similarly, representatives of IPPNW, in meeting with high officials in Russia before the summit, again conveyed the concerns and goals of the Manhattan Project II. At the same time, PSR and IPPNW launched display ads and radio spots for a nuclear moratorium in the *New York Times* and elsewhere in the United States, along with TV spots in Russia [26-28].

The renewed press coverage in major U.S. media (wire services, syndicated columnists, the *Times*, *Post*, ABC, NPR, CNN and others, international press and local American stories, and reprints that accompanied the launching of Manhattan Project II) has been followed by a sustained grassroots organizing effort focused on key Manhattan Project or nuclear anniversaries and held at locations highly symbolic of the need to end the nuclear age. Thus, the project has sent Daniel Ellsberg to the 1992 National SANE/FREEZE Congress in Nashville, Tennessee, not far from Oak Ridge, where his workshop on the Manhattan Project II was the only event on the entire schedule displaying the word nuclear.

At a PSR conference held in September 1992 in Santa Fe and at unprecedented public meetings at the Los Alamos National Laboratory (LANL), Ellsberg addressed LANL senior managers and debated LANL specialists. At another PSR conference held in Denver, Ellsberg and Dr. H. Jack Geiger spotlighted the continuing problems of health, safety, and the environment related to the DOE nuclear weapons complex [29]. Similarly, the Manhattan Project II participated in grassroots events and involved activists throughout the fall in Portland, Seattle, Spokane, Baltimore, and San Francisco.

These activities culminated in local, national, and international commemorations of December 2 as the 50th anniversary of the nuclear age and simultaneous calls for a Manhattan Project II. In Chicago, a coalition of groups held a "Beyond the Nuclear Age" conference. Throughout New England, PSR chapters held "Call to Disarm" events and ran large Manhattan Project II newspaper advertisements in Boston, Portland, and elsewhere. In Europe, numerous IPPNW affiliates held simultaneous press conferences to call for an end to the nuclear age and to release a new book, *Deadly Gold*, which calls for a ban on plutonium [30].

On Capitol Hill, the Manhattan Project II presented a conference at the Rayburn House Office Building for over 125 Hill staff, national press, and representatives of national organizations. Twenty-six national organizations connected with the Manhattan Project II, ranging from the American Baptist Churches and the Council for a Livable World to the Women's International League for Peace and Freedom and the YWCA, co-sponsored the event. The gathering featured 84-year-old Dr. Joseph Rotblat of the London School of Medicine, a member of the MPII Advisory Board, President of Pugwash, and the recipient of the 1992 Albert Einstein Memorial Peace Prize. Rotblat recalled his days in the original Manhattan Project and urged American policy makers to carry out and then go beyond the near-term pragmatic policy goals of the Manhattan Project II, which call for international agreements for very low levels of nuclear arms within three years. Dr. Margaret Brenman-Gibson, a Senior Associate of the MPII Project and a friend and colleague of Leo Szilard's also spoke. Brenman-Gibson, a psychoanalyst and Harvard professor, underscored the urgency of taking advantage of the current favorable climate for disarmament given the volatile nature of human events and personalities. Ellsberg presented a Manhattan Project II Policy Paper for the Clinton transition team and the new Congress. After the presentation of these policy options, the paper was discussed directly with national security staff during the transition and has helped form the basis of new legislation being developed by Representative Pete Stark (D-CA) for introduction in the 103rd Congress. It is still too early to tell whether the Manhattan Project II and the organizations that support it will be able to get early progress and commitments from the Clinton administration on deeper, faster reductions in nuclear weapons, stronger antiproliferation measures, and changes in nuclear policy. Nor is it assured that the Russians will go much further. But it does seem to have been the most appropriate way to have marked the moment that Leo Szilard, a friend and colleague of many of those involved in PSR, IPPNW, Council for a Livable World, the Union of Concerned Scientists, and the Manhattan Project II, called "a black day in human history." Within three years of that day, an international team took atomic fission from a laboratory concept to an atomic bomb.

Now, as we remember that anniversary, it is time to act with similar urgency. This time it is necessary to run the film backwards, to undo the legacy of Stagg Field and Alamogordo, of Hiroshima and Nagasaki, of the Cuban Missile Crisis and Chelyabynsk. Indeed, some of the same protagonists appear in both narratives. It was a member of the new Manhattan Project II advisory board, physicist Philip Morrison of MIT, who carried plutonium in a jeep out to ground zero at Alamogordo to assemble the Trinity bomb. And it was Morrison who accompanied the bomb to Tinian Island that was dropped on Nagasaki [7]. Like Senator Mark Hatfield, who in 1945 saw the ruins of Nagasaki as a young Navy officer, Philip Morrison, after flying over the smoldering ruins of Hiroshima,

has since dedicated his life to disassembling the Bomb.

The Manhattan Project II enlists many of Leo Szilard's old colleagues in an enterprise with a broad range of dedicated physicians, scientists, and activists from younger generations. It is a contemporary, yet historic action, whose slogan is one we think Szilard would have liked. "The Bomb. We Built It. We Can Take It Apart." ❧

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